

photograph of the ice (vol. i., p. 192) shows that it is very regularly stratified, and there is no visible interglacial material; the ice appears very different from that typical of glaciers. A photograph of a block of the barrier ice, of which the structure had been brought out by throwing over it a bucket or two of hot water, would have been very useful. The characters of glacier ice are so distinctive that any precise information as to the structure of the barrier ice would have left no doubt as to its nature. The photograph (Fig. 1) which gives most information about the ice suggests that, at least the part above sea-level (see also Fig. 2) has been formed by the accumulation of layers of snow upon the surface, more quickly than the ice was dissolved by the sea beneath. If this view of the origin of the ice sheet be correct, both its horizontal position and the gentle undulations of its surface are intelligible; and it forms no obstacle to belief in the connection of Graham's Land and Victoria Land along the shortest and most direct line. In this case Ross's ice-sheet will agree in character with the floebergs of Sir George Nares's Palaeocrytic Sea, except that they were supposed to have grown by the additions of layers of ice from the sea below, instead of by the fall of snow from above. In this connection, some information as to the rate of solution and growth of the ice in sea-water at various temperatures would have been useful. Captain Scott tells us that such observations were suggested in the "Antarctic Manual." I have been unable to find there the passage referred to. The suggestion is, however, dismissed (vol. i., p. 305) as ridiculous. More than once during the course of the expedition the observations desired were accidentally noticed, but the conditions are not stated with sufficient precision to be of service.

The structure of Victoria Land, both geographically and geologically, is much as was expected from the considerations which led to the conclusion, first suggested by Ritter, that the eastern coast of Victoria Land represents the continuation of the volcanic line of New Zealand, and that a plateau occurs behind it. The discovery of the plateau structure seems to have occasioned surprise, though the hope was expressed in NATURE, April 25, 1901, p. 612, that one party would "cross the volcanic mountain chain to the plateau that probably lies beyond it." The geological structure, as described in Mr. Ferrar's interesting chapter, consists of low-lying archæan coast hills, beyond which occur sheets of horizontal sediments and broad sheets of plateau basalts. Huge volcanic cones occur off the main coast line, like the worn down volcanic hills of Dunedin and Bank's Peninsula in New Zealand, and apparently there are great volcanic cones on the plateau near its edge. It would be difficult to find land with a structure more typical of the Pacific coast type.

In contrast to the extensive discoveries achieved by the sledging parties from the winter quarters are the limited results obtained at sea, which make the title of the book, "The Voyage of the *Discovery*," somewhat of a misnomer. In the book 176 pages are devoted to describing the whole voyage of the *Discovery* from London to London, and 698 pages to describing the sledging and other work on shore. It was hoped that the *Discovery* would have thrown some light on the two chief problems offered by the outline of Antarctica, in the area reserved for the British sphere of operations. After the discovery of Coats Land by the Scottish expedition, the longest unknown stretch of the Antarctic coast is that south of the Pacific. It was believed from the work of Ross and Cook that land exists connecting Graham's Land to that on the eastern edge of the barrier. The *Discovery* has con-

firmed the existence of land close by the point where Ross described his "strong appearance of land"; but the necessity for the whole expedition returning to winter on McMurdo Sound prevented the discovery of its nature. Captain Scott seems disposed to regard this land as probably volcanic, and Mr. Ferrar as probably continental.

It was also hoped that the expedition would determine the character of the land to the west of Cape Adare; for a section along that coast, which cuts across the grain of the continent, would no doubt give more information as to its structure, than could be obtained along the coast of Victoria Land or by a traverse of the ice-clad interior. But here again the expedition had to return from the threshold of the unknown regions. This was Captain Scott's misfortune, and was in no way his fault. It was the result of the plan of the expedition being to keep the *Discovery* at the winter quarters. The limited work done by the *Discovery* at sea, and its inability to accomplish the much desired deep-sea trawling, is possibly due to the heavy demands on the available coal supply made by her engines; for the 500 horse-power which they gave required a large consumption of fuel, and this rendered impossible any prolonged period of full steaming away from a coaling station. Whether the *Discovery* was a complete success as a ship appears doubtful. Captain Scott praises many features in its design, and of its magnificent strength there can be no question. But in spite (vol. ii. p. 327) of what Captain Scott calls the "depth of sentiment" he naturally feels for the ship, "which for long proved such a comfortable home," he says that when they tested her sailing qualities they "found to our chagrin that they were exceedingly poor"; she had a fine capacity for rolling, sometimes going over 90°, and he describes (vol. ii. p. 375) her "lurching from side to side in the most uncomfortable fashion while our consort [the *Terra Nova*] followed in our wake with scarcely a movement." Her leakiness is described as a continual source of trouble, and the only expression of irritation in the book is at "another very stupid arrangement" in the ship (vol. i. p. 339). But for the somewhat meagre results achieved by the *Discovery* Captain Scott is not responsible; if the ship could have been kept at work at sea, while Captain Scott was doing his sledge journeys on land, a wider and richer harvest of results would doubtless have been obtained.

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KCENT ETHNOLOGICAL PUBLICATIONS FROM THE FIELD COLUMBIAN MUSEUM.¹

OF peculiar interest is Dr. Dorsey's account of the ceremonial organisation of the Cheyenne, which dates back, according to tradition, to two or three thousand years ago, being founded by Motzeyeuff, a prophet who came as a messenger from the Great Medicine with four great medicine arrows, which were sent to the Cheyenne as an emblem for their future, as they possessed magic, and the Great Medicine decreed they should produce effects beyond natural powers. These arrows are still preserved, but two of them are in the hands of the Pawnee. The prophet organised five societies—the Red Shield, Hoof-rattle, Coyote, Dog-men, and Inverted Bowstring. The first two of these are concerned with

¹ Voth, H. R.: "Oraibi Natal Customs and Ceremonies." Field Columbian Museum, Chicago 1905. Anthropological Series, vol. vi., No. 2. "Hopi Proper Names," *ibid.* vol. vi., No. 2. "The Traditions of the Hopi," *ibid.* vol. viii.

Dorsey, G. A.: "The Cheyenne: I. Ceremonial Organisation," *ibid.*, vol. ix., No. 1. "The Cheyenne: II. The Sun-Dance," *ibid.*, vol. ix. No.

the capture respectively of the bison (buffalo), elk, and deer. The Coyote society derives its name from the fact that its members imitate the coyote in their power of endurance, cunning, and activity; they outstrip their fellow-tribesmen in running long distances, playing games, &c. The Dog-men were raiders. It would therefore seem evident that, judging from the analogies in Australia and Torres Straits, these are



FIG. 1.—Self-inflicted torture by a Cheyenne, for performance of the sun-dance. The thongs are attached to the centre-pole. From a painting by a native artist.

in reality ancient totemic clans which were re-organised by the prophet and still retain their magical functions. The Inverted or Bow-string Warrior society is but little known throughout the tribe; it was founded by the prophet subsequently to the others; there was no chief, each warrior being independent of the rest, though all dressed alike and were always prepared for war. The close observance of the regulations of this society by its members gives them a character distinct from that of the other societies, and they are regarded as pure. They rejoice in the beauty of nature as the work of the Great Medicine, who created the rivers, hills, mountains, heavenly bodies, and the clouds. They are the philosophers among the people. Since the advent of the white man a sixth warrior society, the Owl-man's Bow-string or Wolf Warriors, has been founded; it alone, of all the warrior societies, dances with guns, and they shoot blank cartridges. This paper is illustrated by a number of plates, most of which are facsimiles of coloured drawings by Cheyenne artists; they illustrate the ceremonial costumes and paraphernalia of the members of the societies, as well as sun-dance myths; the drawings are so much in advance of those usually drawn by backward peoples as to suggest that the artists learnt from Europeans. It would have been an advantage if Dr. Dorsey had said a little more about the conditions under which they were executed; the idea of illustrating a memoir by native talent is a good one.

The Cheyenne sun-dance is described in considerable

detail in a separate memoir, and is copiously illustrated with 105 figures, nearly all of which are from photographs, and some fifty plates, many of which are in colours. In 1903 Dr. Dorsey published an elaborate monograph on the Arapaho sun-dance (*cf. NATURE*, June 28, 1904), and now we have from his pen a companion account of the same dance as performed by another tribe of Plains Indians. The name given by the Cheyenne to the sun-dance is the New-Life-Lodge; according to the interpretation of the priest, the name means not only the lodge of new life, or lodge of new birth, but it is the new life itself. The performance of the ceremony is supposed to re-create, to re-form, to re-animate the earth, vegetation, and animal life; thus it is the ceremony of the re-birth. As one of the priests put it, "Formerly this dance represented only the creation of the earth. The Cheyenne grew careless and combined other things with the ceremony. At the time of the Love-tipi (or Sacred Lodge), though everything is barren (referring to the bare space made within the tipi), the earth is beginning to grow. Now it has grown. Thus they make the earth, buffalo wallow, grease, wool, and sinew to make growth. By the time of the end of the lodge things have grown, people have become happy; the world has reached its full growth, and people rejoice. When they use the bone whistle they are happy like the eagle, which is typical of all birds and of happiness."

It would take too long to describe the ceremonies, which are evidently very ancient and sacred. Thanks to the labours of Dr. Dorsey and other American colleagues, the religious symbolism of the Plains Indians is beginning to be understood, and researches such as these will afford valuable data to the students of comparative religion. The rite of sacrifice by means of self-inflicted torture was common to many of the Plains tribes, but, so far as is known, it was



FIG. 2.—Incident during self-inflicted torture of a Cheyenne in 1903. Two fragments of old buffalo (bison) skulls were dragged around the inside of the camp circle by thongs attached to the Indian's back.

practised by no tribe to a greater extent than by the Cheyenne. The torture depended upon a vow taken voluntarily; the form most intimately connected with the sun-dance was by attachment in one way or another to the centre-pole; a drawing by a Cheyenne (Fig. 1) illustrates this, and in addition the suspension of buffalo (bison) skulls to the skin. A second form of torture was practised about the camp-

circle rather than within the sun-dance lodge. Of this form the commonest method was for the dancer to drag one or more dried buffalo skulls attached to skewers inserted in his back, just as the skewers were inserted in the breast in the previous form of torture (Fig. 2).

Mr. H. R. Voth continues his valuable investigations on the Hopi Indians with a particularly interesting account of the customs and ceremonies connected with birth in Oraibi, the largest of the seven Hopi villages, and a suggestive paper on Hopi proper names. When a child is twenty days old it receives its first names from the grandmother, or other close relative on its mother's side, and from other women, all of whom must belong to the clan of the mother and child. The "child-name" is retained until the child is initiated into some order or society, when a new name is given, and at every subsequent initiation a fresh name is given. All Hopi proper names have some reference to the clan totem of the name giver, never, unless coincidentally, to the clan totem of the bearer of the name. The same investigator publishes 110 traditions of the Hopi, which were collected in the vernacular and without an interpreter.

A. C. H.

NOTES.

SIR WILLIAM THISELTON-DYER, K.C.M.G., F.R.S., has been elected a member of the American Philosophical Society.

BARON DE GUERNE has been elected president for 1906 of the Paris Geographical Society, M. E. H. Martel chief vice-president, and Baron Hulot general secretary.

THE editors of the *Geological Magazine* have issued invitations to a reception to be held on the evening of February 8, to commemorate the publication of the five hundredth number of that periodical.

PROF. KARL VON FRITSCH, president of the Leopold-Caroline Academy, and professor of geology and palaeontology in the University of Halle, died on January 9 in his sixty-seventh year. Of his written works, the most widely known is his "Allgemeine Geologie."

FROM Basel we learn that Swiss engineers have sketched out a plan for connecting Switzerland with the North Sea and the Mediterranean by means of an immense canal system at an estimated cost of 324,000,000 francs. On the one side Rotterdam is to be reached from Lake Constance by means of the Rhine, and on the other side Lake Como is to be brought into connection with the Mediterranean by means of the River Po.

THE sum of nearly 2000*l.* has been given by Judge Holek (Denmark) for the purpose of effecting Porsild's plan of a biological station in Greenland, and the Danish Government has agreed to be responsible for a large part of the annual upkeep of the station, which is estimated to run to 11,000 kroner (111*l.*). The most eminent travellers in polar regions in general, and in Greenland in particular, have testified to the value of such a station.

ON Thursday next, February 1, Mr. Benjamin Kidd will begin a course of two lectures at the Royal Institution on "The Significance of the Future in the Theory of Evolution," and on Saturday, February 3, Mr. J. W. Gordon will deliver the first of two lectures on "Advances in Microscopy." The Friday evening discourse on February 2 will be delivered by Prof. S. P. Thompson on "The

Electric Production of Nitrates from the Atmosphere," and on February 9 by Mr. H. F. Newall on "Eclipse Problems and Observations."

A NOTE special to Monday's *Pall Mall Gazette* announces that "a new system of wireless electrical communication that seems admirably suited for connection over distances of a few miles, and that possesses the advantage of cheapness, reliability, and secrecy in a degree that probably exceeds all the other systems, has just emerged from some very successful trials in Germany." The experiments described were made near Berlin by Mr. E. Ruhmer, but the "special" news referring to them adds nothing to the account of his system given in NATURE two years ago (February 18, 1904, vol. lxix., p. 373) in an article on "Photo-telephony."

MR. ELNAR MIKKELSEN, the young Danish explorer who, in conjunction with Mr. Leffingwell, an American, is organising an expedition to the Beaufort Sea, has just left this country for the United States. It is proposed that Mr. Leffingwell and other members of the expedition shall travel down the Mackenzie River in the early summer of this year, while Mr. Mikkelsen, should he be able to obtain a suitable vessel, will leave San Francisco in April, and after spending some time on the Siberian coast purchasing necessary equipment, meet the rest of the party at the mouth of the Mackenzie some time in the latter part of August. Thence the expedition will make its way to Cape Kellet, in Banks Land, and begin the exploration of its special region. The work to be undertaken depends to some considerable extent on the arrangements which it may be possible to make with regard to the fitting out of a ship.

AT a meeting at the Royal United Service Institution on January 18, Major Goodwin, D.S.O., delivered a lecture on "Military Hygiene on Active Service." After briefly describing the origin and causation of those diseases which affect armies in the field, and discussing and comparing the statistics of the Boer and Russo-Japanese wars, the lecturer suggested that there are two principal measures, which, if organised and perfected, will entirely remedy, in his opinion, the great evil which has existed in the past. The first measure is sanitary organisation—a corps should be formed of officers and men specially trained in all the methods of sanitation—the second is the necessity for the further education of regimental officers and men in sanitary principles.

THE annual general meeting of the Entomological Society of London was held on January 17. Mr. F. Merrifield, the president, read an address on the general operation of temperature on the growing organism of lepidopterous insects, based on a series of experiments, especially with reference to the remarkable limitations imposed by climatic and artificial conditions. The report of the society showed that for the first time in its history the number of ordinary fellows had reached five hundred. The officers and council were elected for the session 1906-7 as follows:—President, Mr. F. Merrifield; hon. treasurer, Mr. A. H. Jones; hon. secretaries, Mr. H. Rowland-Brown and Commander J. J. Walker, R.N.; librarian, Mr. G. C. Champion; other members of the council, Mr. G. J. Arrow, Mr. A. J. Chitty, Mr. J. E. Collin, Dr. F. A. Dixey, Mr. H. Goss, Mr. W. J. Kaye, Mr. H. J. Lucas, Prof. E. B. Poulton, F.R.S., Mr. L. B. Prout, Mr. E. Saunders, F.R.S., Mr. R. S. Standen, and Mr. C. O. Waterhouse.

DR. H. J. P. SPRENGEL, F.R.S., the inventor of the mercury air-pump, whose death we announced last week, was for three years an assistant in the chemical laboratory